Remarks

Claims 3, 5, 7-9, 10, 11, 14, 17, and 21-26 remain in the application.

The Examiner has rejected claims 12-14 and 25 under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. . In particular, the Examiner states that the limitation "performed at each of a plurality of nodes in a network" is not supported in the specification as originally filed. This rejection is traversed. The background of the invention carefully introduces the role of nodes 14 in a network 10 illustrated in FIG. 1. At page 3, lines 1-12, the nodes 14 are implemented as routers in a TCP/IP network. The Detailed Description at page 8, lines 26-34 then introduces optical routers and the rest of the Detailed Description describes the structure and operation of the inventive optical router. The ordinary mechanic clearly understands that the inventive optical router can be used at all the nodes 14 of FIG. 1. The ordinary mechanic would be unlikely to design an optical network which includes only one optical router of an inventive design. Claims 12 and 13 have been cancelled. Claim 14 has been rewritten in independent form

The Examiner has rejected claims 4, 12, and 13 under 35 U.S.C. 102(e) as being anticipated by Qiao (U.S. Patent Application Publ. 2002/0109878 A1). These claims have been cancelled.

The Examiner has rejected claims 15 and 16 under 35 U.S.C. 102(e) as being anticipated by Johnston (U.S. Patent Application Publ. 2003/0016671 A1). These claims have been cancelled.

The Examiner has rejected claims 1 and 2 under 35 U.S.C. 103(a) as being obvious over Sotom et al. (U.S. Patent 5,896,212) in view of ITU-T G. 692 (ITU-T G.269, "Optical Interfaces for Multichannel Systems with Optical Amplifiers," October 1998, pp. 14-16, hereafter ITU). This rejection is again traversed. The Examiner states that ITU teaches placing the data signal in the 1550nm band and the control or OSC signal in the 1310 band. It is noted that ITU is a standard which does not teach a preferred approach but only limits what is permitted to conform to the standard. It is believed that the best reading of ITU is that both signals should be in the

same or nearly the same band. ITU at top of page 1 states that "[t]his Recommendation applies to optical interfaces for multichannel optical line systems with optical amplifiers for terrestrial long-haul applications." It further states at the bottom of page 1 that "[t]this Recommendation has been prepared from the experience with Erbium-Doped (silica-based) Fibre Amplifiers (EDFA), operating in the 1550 nm wavelength region. Other optical amplifiers operating at different wavelength regions, including the 1310 nm region, are not intended to be excluded from this Recommendation." Based on this wide experience in the 1550nm band, ITU provides in ANNEX A a detailed listing of the 1550nm channel wavelengths. In ANNEX B, ITU states at page 16, B.2 that an alternative OSC wavelength may be in the 1310nm band but that "the boundaries of this wavelength range are for further study." This statement should be interpreted that if the data channels of included within the 1310nm band of indeterminate channel wavelengths and unknown amplifier structure, then the OSC wavelength may be there as well. The opening sentence of ANNEX B is that "[t]wo amplifiers operating with different OSC wavelength will not, in general, be transverse compatible. ITU's Recommendation assumes that optical amplifiers are being used and having wavelengths in different bands introduces the transverse compatibility problem. Finally, in B.3 of ANNEX B, the Recommendation states that the "in-band OSC option [see page 12 at 6.9.1] is aimed for application that are carrying several wavelength through on or more line amplifiers." That is, ITU teaches that WDM methods of claims 7, 12, and 17 should use in-band signalling.

The Examiner has rejected claims 1, 2, 17, 21, 22, and 26 under 35 U.S.C. 103(a) as being obvious over Johnson in view of ITU. Claims 17 and 21 have been rewritten in independent form. All these claims require the data and signalling wavelengths to be in different transmission bands. As argued above, ITU does not teach this feature and Johnston does not supply the deficiency..

The Examiner has rejected claim 3 under 35 U.S.C. 103(a) as being obvious over Johnston and ITU and further in view of Mani et al. (U.S. Patent 6,826,164, hereafter Mani) and Rowan et al. (U.S. Patent 6,529,303, hereafter Rowan). This rejection is traversed. First, this claim depends from a claim believed to be in allowable form and should therefore also be

allowable. The Examiner overstates Mani's teaching at col. 6, l. 61 to col. 7, l. 8 that TDM and FDM are equivalent methods for subdividing an optical wavelength into multiple channels. Mani only says that network links can be implemented as FDM or TDM. There is no hint that FDM can be practiced together with TDM. Mani further states that FDM or TDM can be implemented over multi-wavelength WDM networks. Rowan describes in some detail an FDM implementation of an optical network. As is evident from FIG. 3, the received optical signal is converted to electrical form in 314A before the FDM demultiplexing 316A and the transmitted signal is first FDM multiplexed in 316B before being converted to optical form in 314B. That is, the entire signal, the formatting of which is not disclosed, is subject to the same FDM. The Examiner refers to FIGS. 8 – 10, which show the electrical implementation of FDM demultiplexing and multiplexing. Rowan's FDM switching method 300 of FIG. 3 could well be used in Mani's optical FDM network. However, neither Rowan nor Mani teach separating payload and control information and separately RF multiplexing the control information on a different wavelength from the payload. Johnston, on the other hand, teaches a TDM multiplexing imposed on a WDM network. Accordingly, Johnston's TDM multiplexing could be implemented on the TDM version of Mani's network rather than implementing Rowan's FDM multiplexing on Mani's TDM network. Most importantly, there is no reason to implement only the TDM payload configuration of Johnston on Mani's network while modifying Johnston's TDM control configuration to conform to Rowan's generalized FDM.

Neither Rowan nor Mani mention packet switching and indeed Mani is concerned with cellular networks, a technology believed to be incompatible with packet switching. Thus, only Johnston describes packet switching and his teachings of TDM control information must be followed.

The Examiner attempts to justify the modification "because FDM technique allows expansion by adding more carriers while expansion for TDM requires changing existing components with components of higher clock rate. Therefore, expanding a FDM system for more channels is easier than expanding a TDM system." The Examiner's technical conclusion may *arguendo* in hindsight be correct, but the Examiner fails to find support for this reasoning in

the applied art. Obviousness requires more than good results; it requires a suggestion for the combination in the art. The Examiner is not permitted to substitute his technical reasoning for that of the applied references. It is further pointed out that carrying the Examiner's reasoning to its full extent implies that Johnston's TDM payload and control should both be converted to Rowan's FDM. It is noted that Rowan's FDM apparently treats payload and control as a single signal.

Yet further, any case, the references together fail to teach subcarrier multiplexing upon an optical signal using two RF signals.

For these reasons, Claim 3 should be additionally allowable.

The Examiner has rejected claims 5, 6, 14, 23, and 25 under 35 U.S.C. 103(a) as being obvious over Qiao in view of ITU. This rejection because, as argued above, the ITU reference does not teach putting the payload and control in different transmission bands of the fiber or other transmission medium. For this restriction, Qiao teaches only using different wavelengths for payload and data without reference to transmission bands.

The Examiner has rejected claims 7, 9-11, and 24 under 35 U.S.C. 103(a) as being obvious over Sotom and ITU and further in view of Li et al. ("Low-Loss 1x2 Multimode Interference Wavelength Demultiplexer in Silicon-Germanium Alloy," IEEE Photonics Technology Letters, vol. 11, no. 5, May 1999, hereafter Li). The rejection of claim 9, now incorporated into claim 7, is traversed. As stated above several times, ITU fails to teach placing the payload and control in different transmission bands.

The Examiner has rejected claim 8 under 35 U.S.C. 103(a) as being obvious over Sotom, ITU, and Li and further in view of Mani and Rowan. This rejection is traversed. Claim 8 depends upon a claim believed to be in allowable form. Further, as was argued above, Mani and Rowan do not teach subcarrier multiplexing only the control signals onto a dedicated wavelength.

Entry of this amendment is requested under 37 CFR 1.116 as cancelling claims.

In view of the above amendments and remarks, reconsideration and allowance of all claims are respectfully requested. If the Examiner believes that a telephone interview would be helpful, he is invited to contact the undersigned attorney at the listed telephone number, which is on California time.

Respectfully submitted,

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